



## Simulation Contributes to Successful Mining Plant Upgrade

### The Company

South African mining company Samancor's Chrome Division exports some of its ore, but more than 80% is converted into three grades of ferrochrome at various alloy works in the Samancor Group, making it the world's largest integrated ferrochrome producer. Tubatse Ferrochrome, an important supplier of top-quality ferrochrome, is one of these alloy plants.

### The Challenges

Timing and synchronization are particularly important in the melting and tapping process. The raw materials are in the furnace for a predetermined time. The heat levels of the furnaces are controlled by the power input. To achieve the high temperatures that are required, a huge amount of electricity is consumed. When the metal is ready to be tapped, the ladles and slack pots must be in place so the tap can immediately take place.

Directly after the ladles have been filled with metal, the overhead crane must be available to take the metal to the casting facility. However, unnecessary electricity costs are incurred, and throughput is lost if either the cranes or the ladles are not available; the result: the tap cannot take place. To keep this from happening, a costly, dramatic upgrade was proposed for the tap floor layout. The main reason for the upgrade was that production could be increased substantially with a new layout.

## MINING

### The Deliverables

Tubatse Ferrochrome decided that a simulation study should be performed to test the new design. A model built using Arena® simulation software tested the viability of the proposed layout, with special emphasis on throughput. The main question was whether the new layout would be able to produce at double the rate of the current layout. The study had to sort out the overhead crane rules, determine the number of cranes required, assess the maximum throughput of the plant, and determine system constraints at maximum throughput.



### The Results

The new layout, with its recommended number of resources, has been implemented successfully. The Arena model proved that the new layout would produce the projected throughput without losing any tap opportunities. The model identified constraints in the system and, after scrutinizing overhead crane rules and utilization, revealed that two cranes could be taken out of the system.

**For more information, contact us:**

- [marketing@processdesign.co.za](mailto:marketing@processdesign.co.za)
- +27 (12) 547-6524